

What is claimed is:

1. A network comprising:
  - a set of elements interconnected by services;
  - at least one first subset of said elements defining a private network;
  - at least one second subset of elements different from said first subset defining a provider network wherein at least two subgroups of said first subset of elements may be connected via said provider network;
  - a services hierarchy wherein virtual private networks are defined on said second subset of elements;
  - said services hierarchy comprising a father virtual private network and at least one affiliated son virtual private network;
  - each son virtual private network having at most one affiliated father virtual private network;
  - each father virtual private network responsible for associating services and responsible for associating connections for said at least one affiliated son virtual private network; and
  - said provider network having a means for associating elements comprising said father virtual private network.
2. A network as claimed in claim 1 wherein each said at least one affiliated son virtual private network may recursively act as a father virtual private network for a further virtual private network affiliated as a respective son.

3. A network as claimed in claim 1 wherein said means for associating elements comprising said father virtual private network includes a virtual private network descriptor for each father and each son virtual private network.
4. A network as claimed in claim 3 wherein said virtual private network descriptor contains an association between an address of each element of said father virtual private network and an address of an element of said provider network for each case wherein said networks have direct port connections.
5. A network as claimed in claim 4 wherein said virtual private network descriptor for each father and each son virtual private network are grouped into a set of virtual private network descriptors arranged in a hierarchy, said hierarchy corresponding to a hierarchy defined by said father and said son virtual private networks' affiliations.
6. A network as claimed in claim 5 wherein said means for associating elements further comprises a globally unique identifier associated with said father or said son virtual private network.
7. A network as claimed in claim 6 wherein said means for associating elements further comprises a set associating for each said globally unique identifier a corresponding virtual private network descriptor and an indicator of a level

within said hierarchy defined by said father and said son virtual private networks' affiliations.

8. A method of organizing a network having a set of elements interconnected by services, wherein at least one first subset of said elements defines a private network and at least one second subset of elements different from said first subset defines a provider network and wherein at least two subgroups of said first subset of elements may be connected via said provider network, said method comprising:
  - establishing a services hierarchy wherein virtual private networks are defined on said second subset of elements;
  - establishing within said services hierarchy a father virtual private network and at least one affiliated son virtual private network wherein each son virtual private network has at most one affiliated father virtual private network;
  - establishing each father virtual private network as responsible for associating services and responsible for associating connections for said at least one affiliated son virtual private network; and
  - providing a function for provider network associating elements comprising said father virtual private network.
9. A method as claimed in claim 8 comprising the additional step wherein each said at least one affiliated son virtual private network has an option of

recursively establishing itself as a father virtual private network for a further virtual private network affiliated as a respective son.

10. A method as claimed in claim 8 wherein said function includes a virtual private network descriptor for each father and each son virtual private network.
11. A method as claimed in claim 10 wherein said virtual private network descriptor contains an association between an address of each element of said father virtual private network and an address of an element of said provider network for each case wherein said networks have direct port connections.
12. A method as claimed in claim 11 wherein said virtual private network descriptor for each father and each son virtual private network are grouped into a set of virtual private network descriptors arranged in a hierarchy, said hierarchy corresponding to a hierarchy defined by said father and said son virtual private networks' affiliations.
13. A method as claimed in claim 12 wherein said function further comprises a globally unique identifier associated with said father or said son virtual private network.

14. A method as claimed in claim 13 wherein said function further comprises a set associating for each said globally unique identifier a corresponding virtual private network descriptor and an indicator of a level within said hierarchy defined by said father and said son virtual private networks' affiliations.
15. A method as claimed in claim 14 wherein said set is established by a process of auto-discovery.
16. A method as claimed in claim 15 wherein said process of auto-discovery uses Border Gateway Protocol.
17. An element of a provider network according to the network of claim 1.
18. An element of a private network according to the network of claim 1.